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SOUTHWEST FISHERIES CENTER
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NATIONAL MARINE FISHERIES SERVICE

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SUMMARY OF GREEN TURTLE SURVEYS AND TAGGING ACTIVITIES CONDUCTED AT FRENCH FRIGATE SHOALS, APRIL-AUGUST 1983

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SUMMARY OF GREEN TURTLE SURVEYS AND TAGGING ACTIVITIES CONDUCTED AT FRENCH FRIGATE SHOALS, APRIL-AUGUST 1983

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INTRODUCTION

Over 90% of all breeding by the Hawaiian green turtle, Chelonia mydas, takes place at French Frigate Shoals (Balazs 1980), a coral atoll located in the Northwestern Hawaiian Islands and administered by the U.S. Fish and Wildlife Service (FWS) as part of the Hawaiian Islands National Wildlife Refuge. Although French Frigate Shoals is utilized by green turtles year-round as a resident foraging area, the annual breeding assemblage is primarily composed of adults which have made long-distance migrations to the breeding atoll from other areas of the Hawaiian Archipelago (Balazs 1976). The influx of turtles occurs mid-April through early June, and most courtship and copulation take place at this time. Nesting commences mid-May, peaks in June, then drops to lower levels in late July. By the end of August most of the migratory breeding assemblage has departed (Balazs 1980).

Surveys of basking green turtles were conducted over the period 13 April through 3 August to monitor the relative abundance and reproductive activities of the atoll's breeding assemblage from the onset through most of the 1983 breeding season.

STUDY AREA

The crescent-shaped atoll 16-km in diameter contains 12 islands, 2 of which have been significantly altered by man. Tern Island, modified to serve as an airstrip in 1942, has been continuously occupied since that time and is presently maintained as a research station by the FWS. East Island was occupied by U.S. Coast Guard personnel from 1944 to 1952, and although efforts have been made to remove man-made rubble from the island, buried debris is still present and potentially hazardous or an impediment to nesting turtles. For a complete description of French Frigate Shoals see Amerson (1971).

During the period of this study, the eastern unvegetated area of Trig Island remained separated by water from the higher, vegetated section of the island.

Although turtles bask on most of the islands within the atoll, the resident aggregation most heavily utilizes the northeastern and northern shores of Whale-Skate and Trig Islands, respectively. The incidence of basking on East Island tends to coincide with the breeding season and the arrival of the migratory breeding assemblage (Balazs 1980). In a given breeding season, approximately 55% of the atoll's nesting females nest on East Island, 35% on Whale-Skate Island, and the remainder on Trig, Tern, Gin, and Little Gin Islands (Balazs 1980).

METHODS

Turtle surveys were made in association with the Hawaiian monk seal, Monachus schauinslandi, and green turtle research conducted at French Frigate Shoals 12 April through 3 August 1983 by the Southwest Fisheries

Center Honolulu Laboratory, National Marine Fisheries Service. In addition, monk seal and green turtle censusing was performed every 4 days on Tern Island and approximately every 36 days on an atoll-wide basis by FWS personnel. The sources of data incorporated herein are presented in Tables 1-6.

Between 13 April and 3 August, turtle surveys of Tern, Trig, Whale-Skate, and East Islands were conducted on a regular basis. Occasional overnight visits to Whale-Skate and East Islands made it possible to census turtles on successive days. During the month of June, Whale-Skate and East Islands were surveyed almost daily in connection with the monitoring of green turtle nesting activity. Gin, Little Gin, Disappearing, and Shark Islands were visited infrequently.

Surveys were usually conducted after 1400, when the number of basking turtles is greatest (Table 4, and Balazs[1]). Observers carefully walked around the perimeter of an island and observations of turtles were made through binoculars. When ascertainable, the age class and sex of basking turtles were recorded. Nearshore activities, including copulations, and nesting excavations were noted. Care was taken to insure that turtles and monk seals utilizing the beach were not disturbed. Because of their small size, surveys of Round and Mullet Islands, and occasionally surveys of Trig Island, were made from a boat.

Age class was determined on the basis of straight carapace length: adult, length >81 cm; subadult, length 65-81 cm; juvenile, length <65 cm. Sexual dimorphism is externally apparent only in turtles >65 cm in length (Balazs 1980).

When conditions allowed for minimum disturbance, a basking turtle would be approached and checked for tags. If no tags were present, a size 681 Iconel[2] 625 tag was applied at a proximal location on the trailing edge of a front flipper. Tags already present were read and additional tags applied when possible. Subadult turtles were measured in conjunction with tagging (straight carapace length and width).

As part of the concurrent monitoring of green turtle nesting activity on Whale-Skate and East Islands during June, identification numbers were spray-painted on the carapaces of nesting females to provide short-term recognition of those turtles from a distance. The paint remained in evidence for up to 3 weeks, although the numbers became unreadable after approximately 10 days.

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[1]George H. Balazs, Wildlife Biologist, Southwest Fisheries Center Honolulu Laboratory, National Marine Fisheries Service, NOAA, Honolulu, HI 96812, pers. commun., August 1983.

[2]Reference to trade names does not imply endorsement by the National Marine Fisheries Service, NOAA.

RESULTS

Tags were applied to 22 adult (4 male, 18 female) and 6 subadult (4 female, 2 sex unknown) previously untagged turtles (Table 1). An additional tag was applied to one previously tagged subadult male.

Tag numbers were recovered from 20 adult (11 male, 9 female) and 3 subadult (1 male, 1 female, 1 sex unknown) basking turtles (Table 2). The tag numbers of seven adults (five male, two female) and one subadult (sex unknown) were recovered more than once during the study period.

Atoll-wide, 1.0% (6/632) of the turtles observed basking during surveys were subadults (Tables 1 and 2). The mean straight carapace length of the six subadults was 75.3 cm (range 69.8-80.0 cm). One basking juvenile (straight carapace length 49.2 cm) was observed on East Island.

Results of all surveys (176) are presented in Tables 3-6. Eighty-one percent (143) of these surveys were conducted in part or entirely after 1400, and are therefore comparable to surveys from previous years. Results from these are summarized below by island.

Tern Island

Fifty-one surveys were conducted from 13 April through 31 July. No turtles were observed on 36 surveys (70.6%). One turtle was observed on 14 occasions (27.5%); on only 1 occasion (2.0%) were 2 turtles observed. Basking turtles were more frequently seen during late April.

No copulations were observed. Nesting activity commenced 16 May.

Whale-Skate Island

Forty-three surveys were conducted from 15 April through 2 August. The average number of basking turtles was 5.8 (7.7 for the month of June). The greatest number was observed 7 and 18 June (18 turtles each); on 15 and 18 May, and 28 July no turtles were observed. Numbers of basking turtles fluctuated greatly over the duration of the study.

An attempt was made on every survey to count the number of turtles utilizing the nearshore waters of Whale-Skate to approximately 50 m offshore, although visibility was sometimes limited and the movements of swimming turtles difficult to track. Numbers of turtles in the water were greatest during May and early June, then gradually declined as the breeding season progressed.

Copulations were observed on 2, 3, 5, 6, 7, and 23 May. Nesting activity commenced between 18 and 21 May.

East Island

Thirty-seven surveys were conducted from 7 May through 3 August. The average number of basking turtles was 8.6 (8.5 for the month of June). The greatest number was observed on 3 June (20 turtles); no turtles were observed on 3 August. Numbers of basking turtles were greatest during late May and early June.

Copulations were observed on 7 and 26 May. Nesting activity commenced between 4 and 6 May.

Trig Island

Nine surveys were conducted from 16 April through 3 August. The average number of basking turtles was 4.8. The greatest number observed during a survey was on 15 May (9 turtles); no turtles were observed on 10 June.

Copulations were observed on 5 May. Nesting activity commenced between 28 April and 4 May.

Gin, Little Gin, Disappearing, and Shark Islands

Two surveys were conducted on each island during late April and the first half of May. At those times small numbers of turtles (0-2) were observed. No copulations were observed, and the dates marking the onset of nesting activity, if any, are unknown.

Round and Mullet Islands

These islands were surveyed periodically from a boat from 14 April through 25 July. No basking turtles were observed.

Overall Sex Ratio

Seventy-one percent (443/625) of the adult turtles observed in surveys conducted after 1400 were sexed. The overall sex ratios observed in basking turtles during this study must be seen in light of the following considerations:

1. The daily exchange rate of basking individuals is unknown.

2. Males and females may not bask with the same frequency or in proportion to the sex composition of the atoll's green turtle population during the breeding season.

3. Sex ratios may change during the course of the breeding season. For example, males of the migratory breeding assemblage may arrive at the atoll before the arrival of breeding females and may depart before the departure of breeding females (Balazs 1980).

4. On East and Whale-Skate Islands, females that had been marked with paint during June were easier to sex while basking than males.

5. The percentage of unsexed adult turtles per island ranged from 21 to 30%, as shown below.

Island	Male (%)	Female (%)	Sex unknown (%)	Total observations
Tern	57	21	21	14
Whale-Skate	44	28	28	248
East	17	53	30	317
Trig	42	35	23	43
Atoll-wide	30	41	29	625

Sex ratios observed during the month of June:

Island	Male (%)	Female (%)	Sex unknown (%)	Total observations
Whale-Skate	38	35	27	123
East	14	48	38	177

Balazs (1980) reports a sex ratio on East Island of 34% male (range 23-50%) and 66% female (range 50-81%) based upon counts of basking turtles ashore at one time during June over a number of years. From 15 April to 5 June 1981, Sheekey (1982) observed a sex ratio on Tern Island of 48% male, 52% female based on 31 observations.

CONCLUSION

The dates on which reproductive activities marking the onset of the 1983 breeding season were observed are in accord with the observations of Balazs (1980) and Sheekey (1982).

Numbers of basking turtles on Tern Island were lower than observed by Sheekey (1982) in 1981 during the same period. Compared with previous years, the 1983 breeding season probably represents a year of low reproductive activity (footnote 1).

ACKNOWLEDGMENTS

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Table 1.--Tags applied to green turtle, Chelonia mydas, at French Frigate Shoals (B = basking on shore, N = nesting, F = female, M = male, U = sex unknown, A = adult; SA = subadult). The asterisk indicates a tag recovery. Parentheses contain the 1983 dates on which additional tags were applied.

Date tagged 1983	Location	Status	Sex	Age class	Right tag	Left tag	Straight carapace measurements	
							Length (cm)	Width (cm)
4/28	Trig	B	U	SA	6363	6362	69.8	51.9
5/3	Whale-Skate	B	F	SA	6364	--	78.2	58.5
5/7	Whale-Skate	B	M	SA	3038*	6365	78.6	--
6/3	Whale-Skate	N	F	A	6359	--	--	--
6/3	Whale-Skate	N	F	A	6367	6654(6/7)	86.5	67.2
6/4	Whale-Skate	N	F	A	--	6368	98.8	72.7
6/4	Whale-Skate	N	F	A	--	6370	--	--
6/4	Whale-Skate	N	F	A	6372	6371	88.2	67.0
6/4	Whale-Skate	N	F	A	6374	6373	97.3	74.0
6/6	Whale-Skate	N	F	A	6671/6672(8/2)	6375	88.1	70.6
6/6	Whale-Skate	N	F	A	6667(7/6)	6651	90.9	71.6
6/7	Whale-Skate	N	M	A	--	6652	--	--
6/7	Whale-Skate	B	M	A	--	6653	--	--
6/8	Whale-Skate	B	B	SA	6666(7/3)	6655	76.4	57.0
6/10	Whale-Skate	N	F	A	--	6656	--	--
6/12	Whale-Skate	B	M	A	--	6658	--	--
6/12	Whale-Skate	N	F	A	--	6657	89.2	72.8
6/13	Whale-Skate	N	F	A	--	6659	90.0	70.2
6/15	Whale-Skate	N	F	A	6661	6660	92.4	--
6/17	Whale-Skate	B	M	A	--	6662	--	--
6/19	Whale-Skate	N	F	A	--	6663	94.7	75.0
6/26	Trig	B	F	SA	--	6665	80.0	--
7/9	East	N	F	A	7204	7203	93.7	73.8
7/17	Whale-Skate	B	U	SA	--	6669	70.5	--
7/20	Tern	B	F	SA	6670	--	--	--
7/26	East	N	F	A	7205	7206	94.0	--
7/26	East	N	F	A	7207	7208	--	--
8/3	East	N	F	A	6674	6673	86.7	71.5
8/3	East	N	F	A	--	6675	--	--

Table 2.--Tags recovered from basking green turtle, Chelonia mydas, at French Frigate Shoals (F = female, M = male, U = sex unknown, A = adult, SA = subadult; JH = John Henderson, RW = Rodney Watson, GF = Gale Fairaizl, SL = Susan Lautenslager). The asterisk indicates tag applied.

Date 1983	Location	Sex	Age class	Tag right	Tag left	Straight carapace measurements: Length (cm)	Straight carapace measurements: Width (cm)	Observer	Additional recoveries
4/19	Whale-Skate	F	A	--	2825	--	--	JH	--
4/24	Tern	M	A	6361	--	--	--	JH	5/8, Shark, JH; 6/16, Tern, GF.
5/3	Whale-Skate	M	A	--	5171	--	--	SL	5/12, 6/18 Whale-Skate, SL.
5/4	East	U	SA	3136	3135	49.2	39.2	SL	5/31, East, SL (length 49.2 cm; width 39.0 cm).
5/7	Whale-Skate	M	SA	3038	6365*	76.8	--	SL	--
5/13	Little Gin	M	A	3024	--	--	--	SL	--
6/7	Whale-Skate	M	A	5417	--	--	--	SL	Whale-Skate, 6/17, SL.
6/12	Whale-Skate	M	A	5236	5237	--	--	SL	Whale-Skate, 6/15, SL.
6/18	Whale-Skate	F	A	5986	--	--	--	SL	--
6/19	Whale-Skate	M	A	2400	--	--	--	SL	--
6/20	Whale-Skate	F	A	--	3755	--	--	SL	--
7/2	Whale-Skate	M	A	--	960	--	--	SL	--
7/7	Trig	M	A	3066	--	--	--	RW	--
7/15	East	F	A	--	3846	--	--	SL	--
7/22	Trig	M	A	--	5400	--	--	SL	--
7/25	East	F	A	3628	--	--	--	SL	--
7/25	East	F	A	--	3228	--	--	SL	--
7/28	Trig	F	A	--	5397	--	--	SL	--
7/28	Trig	M	A	--	3277	--	--	SL	--

Table 3.--Tern Island, French Frigate Shoals, surveys of basking green turtle, Chelonia mydas (SA= subadult; GF = Gale Fairaizl, JH = John Henderson; SL = Susan Lautenslager).

Date 1983	Time		Male	Female	Sex unknown	Total	Observer
4/13	1415	1653	0	0	0	0	GF
4/17	1415	1630	0	0	0	0	GF
4/18	1400	1535	--	--	1	1	JH
4/20	1415	1546	1	0	0	1	JH
4/21	1430	1550	0	0	0	0	GF
4/22	1420	--	0	1	0	1	SL
4/24	1506	1658	1	0	0	1	JH
4/25	1430	1615	1	0	0	1	SL
4/27	1550	1645	0	0	0	0	SL
4/29	1430	1510	1	0	0	1	SL
4/30	1400	1620	0	0	0	0	SL
5/1	1545	--	0	0	0	0	SL
5/3	1430	1545	1 SA	0	0	1	GF
5/7	1415	--	0	0	0	0	GF
5/8	1400	--	0	0	0	0	SL
5/11	1430	1600	0	0	0	0	GF
5/13	1430	--	0	0	0	0	GF
5/15	1430	1530	0	0	0	0	SL
5/16	1530	--	--	--	1	1	JH
5/17	1515	--	0	0	0	0	SL
5/19	1407	1545	1	0	0	1	SL
5/21	1437	1530	0	0	0	0	SL
5/23	1430	1545	0	0	0	0	GF
5/24	1425	1435	0	0	0	0	SL
5/25	1430	--	--	--	1	1	SL
5/27	1400	1530	0	0	0	0	GF
5/29	1335	--	0	0	0	0	SL
5/30	1455	--	0	0	0	0	SL
5/31	1430	--	0	0	0	0	GF
6/3	1445	1515	0	0	0	0	SL
6/4	1430	1530	0	0	0	0	GF
6/8	1430	1600	0	0	0	0	GF
6/9	1330	1500	0	0	0	0	GF
6/12	1430	1515	0	0	0	0	GF
6/13	1800	--	0	0	0	0	SL

Table 3.--Continued.

Date 1983	Time		Male	Female	Sex unknown	Total	Observer
6/16	1430	1530	2	0	0	2	GF
6/20	1430	1600	0	0	0	0	GF
6/24	1400	1515	0	0	0	0	GF
6/28	1500	1615	0	0	0	0	GF
7/2	1400	1500	0	0	0	0	GF
7/5	1455	--	0	1	0	1	SL
7/6	1430	1530	0	1 SA	0	1	GF
7/10	1415	1515	0	0	0	0	GF
7/14	1415	1515	0	0	0	0	GF
7/18	1430	1530	1	0	0	1	GF
7/20	1500	--	0	1	0	1	SL
7/22	1430	1530	0	0	0	0	GF
7/23	1630	--	0	0	0	0	SL
7/26	1430	1530	0	0	0	0	GF
7/29	1600	--	0	0	0	0	SL
7/30	1600	--	0	0	0	0	SL
7/31	1700	--	0	0	0	0	SL

Table 4.--Whale-Skate Island, French Frigate Shoals, surveys of basking green turtle, Chelonia mydas (SA = subadult; GF = Gale Fairaizl, JH = John Henderson, RW = Rodney Watson; SL = Susan Lautenslager).

Date 1983	Time		Male	Female	Sex unknown	Number basking	Number in water	Total	Observer
4/15	1400	1506	--	--	4	4	1	5	JH
4/19	1348	1448	--	1	6	7	6	13	JH
4/26	1515	1600	4	2	5	11	7	18	SL
5/3	1430	--	2	--	1 SA	3	21	24	SL
5/4	1525	1600	5	0	0	5	4	9	SL
5/5	1545	1630	8	0	0	8	5	13	SL
5/6	0935	1035	1	1	0	2	1	3	SL
	1215	1255	5	--	1	6	5	11	SL
	1535	1635	9	1	3	13	4	17	SL
5/7	1630	1730	4	0	0	4	7	11	SL
5/10	1715	1803	3	2	0	5	8	13	SL
5/11	1600	1627	3	--	3	6	9	15	SL
5/12	1330	1428	3	--	1	4	12	16	SL
5/13	1130	1230	1	--	1	2	--	2	GF
5/14	1455	1612	2	1	1	4	12	16	SL
5/15	1344	1425	0	0	0	0	10	10	SL
5/18	1521	1600	0	0	0	0	3	3	SL
5/22	1420	1530	5	1	4	10	8	18	SL
5/23	1650	1750	4	4	3	11	7	18	SL
5/24	0750	0830	1	0	0	1	3	4	SL
	1120	1150	4	2	3	9	3	12	SL
5/28	1000	1200	--	2	1	3	--	3	SL
	1355	1455	--	--	3	3	1	4	SL
5/31	1725	1840	3	1	2	6	9	15	SL
6/1	1400	1505	2	1	0	3	8	11	SL
6/4	1510	1610	--	--	1	1	8	9	SL
6/5	1500	1630	3	--	1	4	11	15	SL
6/6	0835	1021	--	1	1	2	0	2	SL
	1513	1632	2	3	4	9	4	13	SL
6/7	1510	1700	7	5	6	18	2	20	SL
6/9	1510	1707	5	1	2	8	8	16	SL
6/10	1410	1515	--	1	2	3	4	7	SL
6/11	1503	1632	3	1	2	6	7	13	SL
6/13	1503	1610	3	1	4	8	7	15	SL
6/15	1510	1710	2	1	0	3	6	9	SL
6/16	1507	1700	3	2	0	5	6	11	SL

Table 4.--Continued.

Date 1983	Time		Male	Female	Sex unknown	Number basking	Number in water	Total	Observer
6/17	1500	1640	4	3	2	9	6	15	SL
6/18	1635	--	7	7	4	18	2	20	SL
6/19	1130	--	3	8	0	11	--	11	SL
	1513	1710	4	5	2	11	0	11	SL
6/20	1508	1750	2	10	0	12	1	13	SL
6/25	1500	1630	--	2	3	5	3	8	SL
7/2	1400	--	--	--	2	2	6	8	SL
7/3	1142	1303	--	1	3	4	2	6	SL
7/6	1300	--	1	--	1	2	3	5	SL
	1635	1725	3	4	0	7	1	8	SL
7/7	1240	1338	--	--	4	4	--	4	JH
	1625	--	--	1	1	2	0	2	SL
7/17	1515	1530	--	--	2(1 SA)	2	7	9	SL
	1700	--	1	3	2 SA	6	--	6	SL
7/18	1320	--	2	--	1 SA	3	--	3	SL
7/21	1210	--	--	--	3	3	--	3	SL
	1610	--	1	1	0	2	5	7	SL
7/22	1100	--	0	0	0	0	--	0	SL
7/25	1100	1200	--	1	3(2 SA)	4	--	4	GF
7/27	1700	--	1	2	0	3	1	4	SL
7/28	1308	1415	0	0	0	0	2	2	SL
8/1	1600	--	0	1	0	1	--	1	SL
8/2	1338	1425	1 SA	1	0	2	1	3	SL
	1630	--	0	1	0	1	--	1	SL

Table 5.--East Island, French Frigate Shoals, surveys of basking green turtle, Chelonia mydas (SA = subadult; DN = David Nelson, GB = George Balazs, GF = Gale Fairaizl, GP = Gail Peiterson, JH = John Henderson, SL = Susan Lautenslager).

Date 1983	Time		Male	Female	Sex unknown	Total	Observer
4/19	1005	1130	2	1	1	4	JH
4/26	1040	1400	1	1	0	2	SL
5/4	0935	1030	2	--	7	9	SL
5/7	1015	1110	0	3	0	3	SL
	1430	1500	3	5	2	10	SL
5/9	1530	1625	3	4	4	11	SL
5/10	1430	1455	4	6	1	11	SL
5/13	1435	1520	--	4	2	6	SL
5/14	1319	--	0	0	0	0	JH
5/18	1454	1515	1	4	2	7	JH
5/20	1402	1425	2	5	0	7	SL
5/23	1100	1200	2	3	4	9	SL
	1440	1530	7	6	2	15	SL
5/26	1115	1230	2	2	3	7	SL
	1540	1610	5	5	3	13	SL
	1600	1703	--	--	14	14	DN
5/27	1000	--	0	0	0	0	SL
	1220	1330	3	1	1	5	SL
5/31	1010	--	1	1	2	4	SL
	1355	1455	2	4	4	10	SL
	1500	1555	--	--	13	13	DN
6/2	1052	1220	--	--	4	4	SL
6/3	1200	--	--	--	3	3	GB
	1258	1430	1	1	6	8	GP
6/4	1930	--	7	4	2	13	GB
	1745	1945	--	--	20	20	GP
6/5	0730	0900	2	0	0	2	GP
	1427	1630	--	1	11	12	GP
6/6	1800	--	3	7	0	10	GB
6/7	1600	--	3	4	5	12	GB
6/8	1630	1723	--	--	11	11	GP
6/9	0847	1050	--	3	4	7	GP
	1730	--	2	2	7	11	GB
6/10	1730	--	1	8	1	10	GB
6/11	1400	--	1	2	5	8	GB
	1800	--	2	4	3	9	GB

Table 5.--Continued.

Date 1983	Time		Male	Female	Sex unknown	Total	Observer
6/12	0940	1150	0	1	0	1	GP
	1745	1945	--	--	4	4	GP
6/13	1016	1215	0	1	0	1	GP
	1501	1550	--	--	3	3	GP
	1700	--	1	7	0	8	GB
6/14	1830	--	0	4	0	4	GB
6/15	1606	1850	--	2	6	8	GP
6/16	1630	--	--	--	2	2	GB
	1800	--	--	1	1	2	GP
6/17	1330	--	1	7	0	8	GB
	1720	--	--	5	3	8	GP
6/18	0907	0954	0	0	0	0	DN
	1700	--	1	7	0	8	GB
6/19	1500	--	2	7	0	9	GB
6/20	1535	--	0	4	0	4	GB
	1800	--	1	4	0	5	GB
6/21	0645	0800	0	0	0	0	DN
6/29	1335	--	--	6	1	7	SL
	1630	1745	--	9	1	10	SL
6/30	1610	--	0	8	0	8	SL
7/1	1800	--	0	5	0	5	SL
7/8	1400	--	2	5	2	9	SL
7/9	1450	1530	1	9	1	11	SL
7/15	1200	--	--	4	2	6	SL
	1615	--	--	5	1 SA	6	SL
7/16	1615	--	--	10	1	11	SL
7/25	1530	--	0	2	0	2	SL
7/26	1610	--	0	2	0	2	SL
7/27	1230	--	0	0	0	0	SL
8/3	1500	--	0	0	0	0	SL
	1700	--	0	1	0	1	SL

Table 6.--Trig, Gin, Little Gin, Disappearing, and Shark Islands, French Frigate Shoals surveys of basking green turtle, Chelonia mydas (SA = subadult; DN = David Nelson, GF = Gale Fairaizl, GP = Gail Peiterson, JH = John Henderson, SL = Susan Lautenslager).

Date 1983	Time		Male	Female	Sex unknown	Total	Observer
				Trig Island			
4/16	1610	1640	1	1	3	5	JH
4/28	1145	1315	1	2	2(1 SA)	5	SL
5/5	1250	1400	7	3	1	11	SL
5/13	1300	1330	3	2	0	5	GF
5/15	1220	1300	2	0	0	2	SL
	1550	--	5	4	0	9	SL
5/18	1640	--	3	2	2	7	SL
5/22	1000	--	--	--	6	6	SL
5/24	1200	--	1	1	3	5	SL
5/27	1500	--	3	3	1	7	SL
6/1	1540	--	2	2	3	7	SL
6/6	1325	1348	--	--	5	5	DN
6/10	1400	1415	0	0	0	0	GF
6/18	1040	1059	--	--	1	1	GP
6/26	1227	1257	0	1	0	1	GP
7/3	1342	--	--	--	3	3	SL
7/7	1425	--	1	1	1	3	SL
7/18	1428	--	2	1	1 SA	4	SL
7/21	1030	--	1	0	0	1	SL
7/22	1338	--	1	0	0	1	SL
7/28	1530	--	1	1	0	2	SL
8/1	1100	--	0	0	0	0	SL
8/3	1330	--	2	0	0	2	SL
				Gin Island			
4/23	1600	--	0	0	0	0	JH
5/13	1100	--	1	0	0	1	JH
				Little Gin Island			
4/23	1600	--	--	--	3	3	JH
5/13	1100	--	2	--	1	3	JH

Table 6.--Continued.

Date 1983	Time		Male	Female	Sex unknown	Total	Observer
			Disappearing Island				
4/23	1232	1454	0	0	0	0	JH
5/13	1114	1250	0	0	0	0	JH
			Shark Island				
5/8	1200	--	1	0	0	1	JH
5/13	0948	1000	0	0	0	0	JH